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EXAMINER	
LEUNG, CHRISTINA Y	
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2613	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/714,451	ALAVIE ET AL.	
	Examiner	Art Unit	
	Christina Y. Leung	2613	

-- ***The MAILING DATE of this communication appears on the cover sheet with the correspondence address*** --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 March 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-76* is/are pending in the application.

4a) Of the above claim(s) *1-27 and 40-67* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *28-30,32-39,68 and 70-76* is/are rejected.

7)☒ Claim(s) *28,31,68 and 69* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1-24-06*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Claims 1-27 and 40-67 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected embodiment, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 29 March 2007.

Examiner acknowledges and agrees with Applicant's statement in the reply that the elected claims, claims 28-39 and 68-76, are claims corresponding to "embodiment 2" (directed to Figure 5A) presented in the requirement for restriction mailed 29 January 2007.

Claim Objections

2. **Claims 28 and 68** are objected to because of the following informalities:

Regarding **claim 28**, Examiner respectfully suggests that Applicant remove the "a)" from in line 2 of the claim, since the other elements in the claim are not subsequently also listed as "b)" or "c)" etc.

Regarding **claim 68**, in line 8 of the claim, the phrase "an length" should be changed to "a length" for grammatical reasons.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. **Claims 37-39, 75, and 76** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not

described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 37 recites that the optical band demultiplexer includes fiber optic branches "wherein the output of each branch is optically coupled to one of the associated detector." However, Examiner notes that claim 28, on which claim 37 depends, recites that the means for demultiplexing has "each output being optically coupled into an associated optical branching device, each optical branching device having a first circulating port being optically coupled to a first end of an associated length of optical fiber, each optical branching device having an output port optically coupled to an associated detector" such as illustrated by Applicant's Figure 5A. Examiner respectfully notes that Applicant's specification does not appear to support an embodiment wherein the band demultiplexer would be connected in the way recited in claim 37 (wherein the elements are also connected in the way already recited in claim 28).

Claims 38 and 39 depend on claim 37 and are therefore also indefinite for the reason given for claim 37. Claim 38 also additionally recites "wherein each of the K output branches [of the band demultiplexer] is optically coupled to one of the associated detectors" and claim 39 also additionally recites narrowband filters of the band demultiplexer connected "to one of the associated detectors." Again, Examiner respectfully notes that Applicant's specification does not appear to support an embodiment wherein the band demultiplexer would be connected in the way recited in claims 37-39 (wherein the elements are also connected in the way already recited in claim 28).

Similarly, **claim 75** recites "wherein each of the K output branches [of the band demultiplexer] is optically coupled to one of the associated detectors" and **claim 76** recites "so

that all the pre-selected number of wavelength bands K are individually output from the fiber optic array [of the band demultiplexer] to an associated detector." However, Examiner notes that claim 68, on which claims 75 and 76 depend, recites "directing the demultiplexed wavelength channels from each of the pre-selected number (K) wavelength bands into an associated optical branching device and into an length of optical fiber coupled thereto" and recites other connections between the elements such that the system generally corresponds to the one illustrated by Applicant's Figure 5A. Again, Examiner respectfully notes that Applicant's specification does not appear to support an embodiment wherein the band demultiplexing elements would be connected in the way recited in claims 75 and 76 (wherein the elements are also connected in the way already recited in parent claims 68 and 74).

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. **Claims 37 and 70** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 37 recites "the optical band demultiplexer" in lines 1-2 of the claim. There is insufficient antecedent basis for this limitation in the claim because claim 28 on which claim 37 depends previously recites "a means for demultiplexing" but not an optical band demultiplexer.

Claim 70 currently depends on "claim 88." The claim is indefinite because there is no claim 88. Based on Applicant's specification and Applicant's other claims, Examiner respectfully notes that claim 70 may be amended to depend on claim 68 instead.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. **Claims 28-30 and 32-35** are rejected under 35 U.S.C. 103(a) as being unpatentable over Downie et al. (US 2004/0197097 A1) in view of Meli (US 5,793,508 A), Kulishov (US 6,353,690 B1), and Huber (US 5,579,143 A).

Regarding **claim 28**, Downie et al. disclose an optical performance monitor (Figure 7), comprising:

a means for demultiplexing (coarse WDM demultiplexer 54) input optical signals into a pre-selected number of wavelength bands, each wavelength band containing a pre-selected number of wavelength channels, the means for demultiplexing the optical signals having a number of outputs equal to the pre-selected number of wavelength bands with each output being optically coupled into an associated optical branching device (optical circulators or splitters 52A-N), each optical branching device having a first circulating port being optically coupled to a first end of an associated length of optical fiber, each optical branching device having an output port optically coupled to an associated detector (i.e., BER/Q measurement devices as shown in Figure 7, which include optical receivers; page 2, paragraph [0026]);

each length of optical fiber having a fiber Bragg grating 50A-N, each of the gratings having a different associated Bragg wavelength, the length of optical fiber having a second end

being a low reflection termination (as shown in Figure 7; page 3, paragraph [0030]; page 4, paragraph [0034]);

tuning means attached to the fiber Bragg gratings for shifting the associated Bragg wavelengths of each grating (page 3, paragraph [0030]; page 4, paragraph [0034]);

wherein a fiber Bragg grating in each length of optical fiber is switched to coincide with a pre-selected wavelength channel, the pre-selected wavelength channels in each fiber are reflected back through the optical branching device attached to each length of optical fiber and out through its output port into the associated detector connected thereto (i.e., BER/Q measurement devices as shown in Figure 7), whereupon the wavelength channels of each wavelength band are interrogated to determine pre-selected properties of the optical signals (pages 2-3, paragraphs [0026]-[0029]; page 4, paragraph [0034]).

With respect to "tuning means," Examiner notes that Downie et al. disclose that the gratings are tunable; although they do not explicitly illustrate tuning means, it would be well understood in the art that the system inherently includes some means for performing this tuning.

Further regarding claim 28, Downie et al. do not specifically disclose an optical isolator coupled to the input of the means for demultiplexing.

However, optical isolator elements are well known in the optical communications art, and Meli in particular teaches an optical isolator 14 coupled to the input of a means for demultiplexing in an optical communications system (Figure 1; column 5, lines 8-16; column 9, lines 33-36). It would have been obvious to a person of ordinary skill in the art to include an optical isolator as taught by Meli in the system disclosed by Downie et al. in order to

advantageously prevent undesirable reflected signals from traveling backwards from the input of means for demultiplexing toward the transmitting end of the communications system.

Further regarding claim 28, Downie et al. disclose fiber Bragg gratings that are tunable by some tuning means, but they do not specifically disclose inducing a pre-selected amount of change in both fiber Bragg grating period and refractive index in each fiber Bragg grating.

However, various implementations of tunable gratings are well known in the optical communications art, and Kulishov in particular teaches a related tunable fiber Bragg grating element. Kulishov further teaches inducing a pre-selected amount of change in both fiber Bragg grating period and refractive index to shift the associated Bragg wavelength of the grating (column 2, lines 12-14; column 6, lines 5-52). It would have been obvious to a person of ordinary skill in the art to change in both fiber Bragg grating period and refractive index as taught by Kulishov in the system disclosed by Downie et al. in order to effectively provide the wavelength tuning function already disclosed by Downie et al. and ensure that the system may flexibly direct different wavelengths at different times as desired.

Further regarding claim 28, Downie et al. disclose a fiber Bragg grating coupled to each length of optical fiber associated with each output of the means for demultiplexing and each optical branching device, but they do not specifically disclose that each length of optical fiber includes an array of fiber Bragg gratings including a pre-selected number of spatially-separated fiber Bragg gratings.

However, Huber teaches a related optical communications system wherein signals having particular wavelengths are selected, and Huber further teaches selecting wavelengths using a

fiber Bragg grating array including a pre-selected number of spatially-separated fiber Bragg gratings 306A-J (Figure 9; column 14, lines 1-67; column 15, lines 1-11).

It would have been obvious to a person of ordinary skill in the art to use arrays of spatially-separated fiber Bragg gratings as taught by Huber in each length of optical fiber in the system disclosed by Downie et al. in order to effectively select a plurality of different wavelengths at a time from each length of fiber and thereby advantageously direct and process more signals efficiently.

Regarding **claim 29**, Downie et al. disclose that the means for demultiplexing the input optical signals is an optical band demultiplexer (coarse wavelength division demultiplexer or band splitter 54 as shown in Figure 7; page 3, paragraph [0032]).

Regarding **claim 30**, Downie et al. disclose that the means for demultiplexing (i.e., bandsplitter 54) the input optical signals is a 1 x K optical splitter in which K is the pre-selected number of wavelength bands, and wherein the fiber Bragg gratings have a pre-selected out-of-band rejection ratio.

Regarding **claim 32**, Downie et al. disclose that the pre-selected properties of the wavelength channels including wavelength channel identification, wavelength channel power and wavelength channel optical-signal-to-noise-ratio (page 1, paragraph [0004]).

Regarding **claim 33 and 34**, Downie et al. disclose that the optical branching device 52 is an optical circulator or an optical coupler (Figure 7; page 3, paragraph [0030]).

Regarding **claim 35**, Downie et al. disclose that the detectors are individual discrete detectors (i.e., they disclose that the measurement devices 42 comprise optical receivers; pages 2-3, paragraphs [0026]-[0027]).

9. **Claim 68 and 70-72 are** rejected under 35 U.S.C. 103(a) as being unpatentable over Downie et al. in view of Kulishov and Huber.

Regarding **claim 68**, Downie et al. disclose a method of monitoring optical performance of optical signals in an optical fiber (Figure 7), comprising the steps of:

a) demultiplexing optical signals into a pre-selected number (K) of wavelength bands, each wavelength band containing a pre-selected number of wavelength channels (using coarse WDM demultiplexer 54 as shown in Figure 7; page 4, paragraph [0034]);

b) directing the demultiplexed wavelength channels from each of the pre-selected number (K) wavelength bands into an associated optical branching device (one of optical circulators or splitters 52A-N as shown in Figure 7) and into a length of optical fiber coupled thereto,

each length of optical fiber having a fiber Bragg grating 50A-N, each grating having different associated Bragg wavelength and being tunable among a pre-selected number (L) of wavelength positions with each wavelength position coinciding with an associated pre-selected wavelength channel from the wavelength band routed into the length of optical fiber such that each fiber Bragg grating reflects its (L) pre-selected wavelength channels back through the optical branching device attached thereto, the length of optical fiber having a second end being a low reflection termination (Figure 7);

c) tuning the fiber Bragg grating in each of the optical fibers for shifting the associated Bragg wavelength of each fiber Bragg grating to coincide with an associated pre-selected wavelength channel from the pre-selected wavelength band such that the pre-selected fiber Bragg grating reflects the associated pre-selected wavelength channel back through its associated optical branching device, and detecting the reflected pre-selected wavelength channel from each

wavelength band and interrogating the detected wavelength channels to determine pre-selected properties of the optical signals contained therein (using BER/Q measurement devices as shown in Figure 7, which include optical receivers; pages 2-3, paragraphs [0026]-[0029]; page 4, paragraph [0034]).

Further regarding claim 68, Downie et al. further generally discloses repeating the steps for each grating and for each wavelength band until all the wavelength channels are detected (page 4, paragraph [0035]).

Further regarding claim 68, Downie et al. disclose a fiber Bragg grating coupled to each length of optical fiber associated with each output of the means for demultiplexing and each optical branching device, but they do not specifically disclose that each length of optical fiber includes an array of fiber Bragg gratings including a pre-selected number (M) of spatially-separated fiber Bragg gratings.

However, Huber teaches a related optical communications system wherein signals having particular wavelengths are selected, and Huber further teaches selecting wavelengths using a fiber Bragg grating array including a pre-selected number of spatially-separated fiber Bragg gratings 306A-J (Figure 9; column 14, lines 1-67; column 15, lines 1-11).

It would have been obvious to a person of ordinary skill in the art to use arrays of M spatially-separated fiber Bragg gratings as taught by Huber in each length of optical fiber in the system disclosed by Downie et al. in order to effectively select a plurality of different wavelengths at a time from each length of fiber and thereby advantageously direct and process more signals efficiently.

Further regarding claim 68, Downie et al. disclose fiber Bragg gratings that are tunable by some tuning means, but they do not specifically disclose inducing a pre-selected amount of change in both fiber Bragg grating period and refractive index in each fiber Bragg grating.

However, various implementations of tunable gratings are well known in the optical communications art, and Kulishov in particular teaches a related tunable fiber Bragg grating element. Kulishov further teaches inducing a pre-selected amount of change in both fiber Bragg grating period and refractive index to shift the associated Bragg wavelength of the grating (column 2, lines 12-14; column 6, lines 5-52). It would have been obvious to a person of ordinary skill in the art to change in both fiber Bragg grating period and refractive index as taught by Kulishov in the system disclosed by Downie et al. in order to effectively provide the wavelength tuning function already disclosed by Downie et al. and ensure that the system may flexibly direct different wavelengths at different times as desired.

Regarding **claims 70 and 71,** Downie et al. disclose that the optical branching device 52 is an optical circulator or an optical coupler (Figure 7; page 3, paragraph [0030]).

Regarding **claim 72**, Downie et al. disclose the step of detecting is performed using individual discrete detectors (i.e., they disclose that the measurement devices 42 comprise optical receivers; pages 2-3, paragraphs [0026]-[0027]).

10. **Claim 36** is rejected under 35 U.S.C. 103(a) as being unpatentable over Downie et al. in view of Meli, Kulishov, and Huber as applied to claim 28 above, and further in view of Vohra (US 2002/0176134 A1).

Regarding **claim 36**, Downie et al. in view of Meli, Kulishov, and Huber describe a system as discussed above with regard to claim 28 above. Downie et al. disclose detectors (pages

2-3, paragraphs [0026]-[0027) but do not specifically disclose that the detectors are part of a single detector-array.

However, Vohra teaches a related system including detecting a plurality of demultiplexed optical signals (Figure 6) and teaches a detector array (page 6, paragraph [0058]). It would have been obvious to a person of ordinary skill in the art use a detector array as taught by Vohra in the system described by Downie et al. in view of Meli, Kulishov, and Huber as an engineering design choice of an efficient way to implement the already disclosed plurality of detectors.

11. **Claim 73** is rejected under 35 U.S.C. 103(a) as being unpatentable over Downie et al. in view of Kulishov, and Huber as applied to claim 68 above, and further in view of Vohra.

Regarding **claim 73**, Downie et al. in view of Kulishov, and Huber describe a method as discussed above with regard to claim 68 above. Downie et al. disclose detectors (pages 2-3, paragraphs [0026]-[0027) but do not specifically disclose that the detectors are part of a single detector-array.

However, Vohra teaches a related system including detecting a plurality of demultiplexed optical signals (Figure 6) and teaches a detector array (page 6, paragraph [0058]). It would have been obvious to a person of ordinary skill in the art use a detector array as taught by Vohra in the method described by Downie et al. in view of Kulishov, and Huber as an engineering design choice of an efficient way to implement the already disclosed plurality of detectors.

12. **Claim 37** is rejected under 35 U.S.C. 103(a) as being unpatentable over Downie et al. in view of Meli, Kulishov, and Huber as applied to claim 28 above, and further in view of Mizrahi (US 5,457,760 A).

Regarding **claim 37**, as well as the claim may be understood with respect to 35 U.S.C. 112 discussed above, Downie et al. in view of Meli, Kulishov, and Huber describe a system as discussed above with regard to claim 28 above. Downie et al. further disclose that the optical band demultiplexer transmits only one selected wavelength band at each output and that the optical signals from each wavelength band are interrogated independently of all remaining wavelength bands (Figure 7; page 4, paragraph [0034]). Downie et al. do not specifically disclose details regarding how the optical band demultiplexer is implemented.

However, Mizrahi teaches a related optical band demultiplexer element and further teaches that optical band demultiplexer comprises a **fiber optic filter array** including fiber optic branches with each fiber optic branch having fiber Bragg gratings 260, the fiber Bragg gratings in each fiber optic branch having Bragg wavelengths selected to transmit only one wavelength band at an output of each branch of the fiber optic branches (Figure 2; column 4, lines 64-67; column 5, lines 1-32).

Regarding claim 37, it would have been obvious to a person of ordinary skill in the art to use a fiber optic filter array as taught by Mizrahi in the system described by Downie et al. in view of Meli, Kulishov, and Huber in order to implement the already-disclosed band demultiplexer in a way that is advantageously easy to manufacture and insensitive to polarization (Mizrahi, column 1, lines 64-67; column 2, lines 1-4).

13. **Claim 74** is rejected under 35 U.S.C. 103(a) as being unpatentable over Downie et al. in view of Kulishov and Huber as applied to claim 68 above, and further in view of Mizrahi.

Regarding **claim 74**, as well as the claim may be understood with respect to 35 U.S.C. 112 discussed above, Downie et al. in view of Kulishov and Huber describe a method as

discussed above with regard to claim 68 above. Downie et al. further disclose that the step of demultiplexing includes transmitting a different pre-selected wavelength band from all the others so that each of the wavelength bands are output (using bandsplitter 54 as shown in Figure 7; page 4, paragraph [0034])). Downie et al. do not specifically disclose details regarding how the optical band demultiplexer is implemented and do not specifically disclose splitting and reproducing the optical signals in all the pre-selected wavelength bands in a pre-selected number of fiber optic branches.

However, Mizrahi teaches a related optical band demultiplexer element (Figure 2) and further teaches splitting and reproducing optical signals (using coupler 230), and filtering the optical signals in each of the pre-selected fiber optic branches to transmit only one of the pre-selected wavelength bands and reflect all the other pre-selected wavelength bands (using fiber Bragg gratings 260), wherein each fiber optic branch transmits a different pre-selected wavelength band from all the others so that each of the wavelength bands are output from the pre-selected number of fiber optic branches (column 4, lines 64-67; column 5, lines 1-32).

Regarding claim 74, it would have been obvious to a person of ordinary skill in the art to use a fiber optic filter array as taught by Mizrahi in the method described by Downie et al. in view of Kulishov and Huber in order to implement the already-disclosed band demultiplexer in a way that is advantageously easy to manufacture and insensitive to polarization (Mizrahi, column 1, lines 64-67; column 2, lines 1-4).

14. **Claims 38 and 39** are rejected under 35 U.S.C. 103(a) as being unpatentable over Downie et al. in view of Meli, Kulishov, Huber, and Mizrahi as applied to claim 37 above, and further in view of Lin et al. (US 2002/0012144 A1).

Regarding **claims 38 and 39**, as well as the claims may be understood with respect to 35 U.S.C. 112 discussed above, Downie et al. in view of Meli, Kulishov, Huber, and Mizrahi describe a system as discussed above with regard to claim 37 above including a band demultiplexer comprising a fiber optic filter array as suggested by Mizrahi.

Regarding claims 38 and 39, Mizrahi further teaches that **the fiber optic filter array** includes a 1 x K optic splitter (coupler 230) having an input connected to the output port of the optical branching device and K output branches each having all pre-selected wavelength bands routed therein, wherein each of the K output branches includes a broadband fiber Bragg grating to transmit one of the wavelength bands and reflect all remaining wavelength bands (Figure 2 column 4, lines 64-67; column 5, lines 1-32).

Further regarding claim 39 in particular, Mizrahi teaches **the fiber optic filter array** includes a 1 x 2 optic splitter (coupler 230) and generally teaches cascading a plurality of couplers (Figure 2) but does not explicitly teach multiple cascaded 1 x 2 optical splitters. However, Mizrahi does specifically teach that various combinations of optical coupling elements may be used (column 6, lines 64-67; column 7, lines 1-2), and it would have been obvious to a person of ordinary skill in the art to specifically use 1x2 couplers in order to properly to implement a demultiplexer having a particular desired number of outputs.

Again, regarding both claims 38 and 39, it would have been obvious to a person of ordinary skill in the art to use a fiber optic filter array as suggested by Mizrahi in the system described by Downie et al. in view of Meli, Kulishov, and Huber in order to implement the already-disclosed band demultiplexer in a way that is advantageously easy to manufacture and insensitive to polarization (Mizrahi, column 1, lines 64-67; column 2, lines 1-4).

Further regarding claims 38 and 39, Mizrahi does not further specifically teach narrowband filters. However, Lin et al. teach related optical communications system including demultiplexing elements (Figure 7). Lin et al. further teach including additional filters (such as filters 320 and 321 in Figure 7) for filtering optical channels that have already been demultiplexed.

Regarding claims 38 and 39, it would have been obvious to a person of ordinary skill in the art include narrowband filters as suggested by Lin et al. in the system described by Downie et al. in view of Meli, Kulishov, Huber, and Mizrahi in order to advantageously reduce crosstalk or noise between the demultiplexer outputs.

15. **Claims 75 and 76** are rejected under 35 U.S.C. 103(a) as being unpatentable over Downie et al. in view of Kulishov, Huber, and Mizrahi as applied to claim 74 above, and further in view of Lin et al.

Regarding **claims 75 and 76**, as well as the claims may be understood with respect to 35 U.S.C. 112 discussed above, Downie et al. in view of Kulishov, Huber, and Mizrahi describe a method as discussed above with regard to claim 74 above including a band demultiplexer comprising a fiber optic filter array as suggested by Mizrahi.

Regarding claims 75 and 76, Mizrahi further teaches that the fiber optic filter array includes a 1 x K optic splitter (coupler 230) having an input connected to the output port of the optical branching device and K output branches each having all pre-selected wavelength bands routed therein, wherein each of the K output branches includes a broadband fiber Bragg grating to transmit one of the wavelength bands and reflect all remaining wavelength bands (Figure 2 column 4, lines 64-67; column 5, lines 1-32).

Further regarding claim 76 in particular, Mizrahi teaches the fiber optic filter array includes a 1 x 2 optic splitter (coupler 230) and generally teaches cascading a plurality of couplers (Figure 2) but does not explicitly teach multiple cascaded 1 x 2 optical splitters. However, Mizrahi does specifically teach that various combinations of optical coupling elements may be used (column 6, lines 64-67; column 7, lines 1-2), and it would have been obvious to a person of ordinary skill in the art to specifically use 1x2 couplers in order to properly to implement a demultiplexer having a particular desired number of outputs.

Again, regarding both claims 75 and 76, it would have been obvious to a person of ordinary skill in the art to use a fiber optic filter array as suggested by Mizrahi in the method described by Downie et al. in view of Kulishov, and Huber in order to implement the already-disclosed band demultiplexer in a way that is advantageously easy to manufacture and insensitive to polarization (Mizrahi, column 1, lines 64-67; column 2, lines 1-4).

Further regarding claims 75 and 76, Mizrahi does not further specifically teach narrowband filters. However, Lin et al. teach related optical communications system including demultiplexing elements (Figure 7). Lin et al. further teach including additional filters (such as filters 320 and 321 in Figure 7) for filtering optical channels that have already been demultiplexed.

Regarding claims 75 and 76, it would have been obvious to a person of ordinary skill in the art include narrowband filters as suggested by Lin et al. in the system described by Downie et al. in view of Kulishov, Huber, and Mizrahi in order to advantageously reduce crosstalk or noise between the demultiplexer outputs.

Allowable Subject Matter

16. Claims 31 and 69 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

17. The following is a statement of reasons for the indication of allowable subject matter:

The prior art, including Downie et al., Meli, Kulishov, Huber, Mizrahi, Vohra, and Lin et al., does not specifically disclose or fairly suggest a system or method including all of the elements, steps, and limitations recited in claims 31 and 69 (including all the limitations of their respective parent claims), particularly wherein each optical fiber has the same number of spatially-separated fiber Bragg gratings, each spatially-separated fiber Bragg grating in different optical fibers but in the same corresponding fiber positions being attached to a common tuning means such that all the fiber Bragg gratings in the same corresponding fiber positions are switched at the same time.

Conclusion

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christina Y. Leung whose telephone number is 571-272-3023. The examiner can normally be reached on Monday to Friday, 7:30 to 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571-272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Christina Leung
CHRISTINA LEUNG
PRIMARY EXAMINER